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(54) **MESH-ADJUSTABLE MOLECULAR SIEVE**

(75) Inventors: **Hong-Cai Zhou**, Oxford, OH (US);
Shengqian Ma, Oxford, OH (US)

(73) Assignee: **Miami University**, Oxford, OH (US)

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556/1; 556/170; 502/401

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See application file for complete search history.

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Primary Examiner—Frank M Lawrence

(74) **Attorney, Agent, or Firm**—Jason H. Foster; Kremlas & Foster

(57) **ABSTRACT**

Temperature-adjustable pore size molecular sieves comprise a plurality of metal clusters bound with a plurality of amphiphilic ligands, each ligand comprising a functionalized hydrophobic moiety and a functionalized hydrophilic moiety, and wherein the metal clusters and amphiphilic ligand hydrophilic moieties form a metal cluster layer, the metal cluster layer forming at least one hydrophilic pore. On each side of the metal cluster layer, a plurality of associated amphiphilic ligand hydrophobic moieties cooperate with the metal cluster layer to form a tri-layer and a plurality of tri-layers are held in proximity with each other to form at least one hydrophobic chamber.

24 Claims, 40 Drawing Sheets

